

**SCHRADERANTHUS, A NEW GENUS OF SOLANACEAE****John E. Averett**

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**ABSTRACT**

*Saracha viscosa* Schrader, of Mexico and Central America, has been positioned in a variety of genera since it was first described, most notably *Athenaea*, *Jaltomata* and *Leucophysalis*. Arguments are presented for the exclusion of the taxon from those genera and its recognition as a new genus, *Schraderanthus*.

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**KEY WORDS;** Solanaceae, *Athenaea*, *Chamaesaracha*, *Jaltomata*, *Leucophysalis*, *Physalis*, *Saracha*, *Witheringia*, Mexico.

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A Mexican and Central American species that in most recent literature has been treated as *Athenaea viscosa* or *Leucophysalis viscosa* has been placed in seven different genera since its description as *Saracha viscosa* in 1832. It also was treated as a species of *Physalis*, requiring a new specific epithet because of the earlier name, *P. viscosa* L. *Saracha viscosa* was described from plants grown from seeds collected in Mexico but the species extends into Guatemala. Current data and generic concepts provide strong support for the recognition of this problematic species as a new monotypic genus. While the single species concerned is reasonably well-known, the following synopsis is provided.

**Schraderanthus** Averett, **Gen. nov.**

Herbae vel frutices usque ad 1-2.5 m altae; inflorescentiae fasciculatae axillares; calyx accrescens fructificans campanulatus, basi rotundatus, lobis 5 aequalibus, ad apicem acutis, in fructu maturo campanulato-retrorsis, baccam rubro-aurantiaca, 10-15 mm diametro; semina ca 50-75.

Erect herbs or soft-wooded shrubs 1.0-2.5 m tall, viscid, glandular-pubescent; inflorescences fasciculate with 6-8 (-10) flowers per axil, corolla 5-lobed with greenish maculations in the throat, ca 4 cm in diameter, rotate; anthers bluish (drying to a yellow-green), the filaments inserted at the base; flowering calyx accrescent, exceeding the length of the corolla, deeply lobed to ca  $\frac{3}{4}$  the length of the calyx, lobes acute; fruiting calyx broadly campanulate, deeply lobed, exceeding the berry but becoming reflexed at maturity, exposing the berry; berry bright red to orange-red, seeds ca 50-75, reniform, brown, ca 2 mm long, the testa rugose-reticulate.

The most distinctive aspects of this novel genus are the 6-8 flowers in fascicles, as opposed to 1-2 per axil in some related genera and the bright red to orange-red berries surrounded by an accrescent calyx which initially loosely envelops the fruit and then opens into a broad campanulate to reflexed structure beneath the berry. These are features unknown in any of the genera to which the entity has been previously aligned. The nature of the calyx, in particular, is not always captured on dried specimens (including the type), and is not illustrated by Hunziker (2001), but is well illustrated in the *Flora de Veracruz* (Nee, 1986).

The genus is named for Heinrich Schrader who first described the species concerned.

**Type species:** *Schraderanthus viscosus* (Schrad.) Averett, **Comb. nov.**

**Basionym:** *Saracha viscosa* Schrader, *Index Seminum* [Göttingen] 5. 1832. TYPE: Cult., Hort. Göttingen, *Schrader s.n.* (MO, not seen.; phototype seen on TROPICOS).

**Synonymy:**

*Physalis schraderiana* Bernh., *Linnaea* 13: 361. 1839.

*Witheringia viscosa* (Schrad.) Miers, *Ann. Mag. Nat. Hist.*, ser. 2, 11(62): 92. 1853

*Athenaea viscosa* (Schrad.) Fernald, *Proc. Amer. Acad. Arts* 35: 567. 1900.

*Jaltomata viscosa* (Schrad.) D'Arcy & Til. Davis, Ann. Missouri Bot. Gard. 63: 363. 1976[1977].

*Leucophysalis viscosa* (Schrad.) Hunz., Kurtziana 21: 283. 1991.

*Chamaesaracha viscosa* (Schrad.) Hunz., Lorentzia 8: 8. 1995.

Complete descriptions of the species are provided by D'Arcy (1976) as *Jaltomata viscosa*, and as *Leucophysalis viscosa* (Hunziker, 2001). The species is also described as *Athenaea viscosa* in the Flora of Guatemala (Gentry and Standley, 1974) and in Spanish in the Flora de Veracruz (Nee, 1986). It is a very distinct species and unlikely to be confused with anything else except, perhaps, *Brachistus nelsonii* (Fernald) D'Arcy, J. Gentry & Averett and further description does not seem required. *Schraderanthus viscosus* occurs in the Mexican states of Chiapas, Oaxaca and Veracruz and extends into Guatemala. The location in Veracruz is from cited material (Nee, 1986); the later notes that the species as rare and little-known in Veracruz.

**ADDITIONAL SPECIMENS: GUATEMALA: Baja Verapaz:** Unión Barrios, west of km 154 on the Cobán road, 12 Apr 1975. *Lundell & Contreras 19171* (LL); **MEXICO: Chiapas,** Mpio. La Independencia, logging road from Las Margaritas to Campo Alegre, 2300 m, 18 Feb 1973, *Breedlove 33631* (NY, TEX); **Oaxaca,** Distr. Mixe, 2 km N de San Miguel Metepec, 8 Apr 1984, *Torres & Martínez 4967* (LL); Oaxaca, ca 6 km S of Totontepec, 18 Feb 1992, *Panero & Campos 2761* (TEX); Distr. Ixtlán, Mpio. Santiago Comaltepec, Soyalapan, 100 m, 17°45'N, 96°30'W [imprecise], 16 May 1988, *E. López G. 120* (NY); Distr. Ixtlán, Sierra de Juárez, camino de Calpulalpan a Llano Verde, 12 km al NO de Calpulalpan, 2500 m, 29 May 1983, *Lorence & Cedillo 4195* (NY); Sierra Mazateca, Mpio. Mazatlán Villa de Flores, San Pedro de los Encinos, 18°04'05.3"W, 96°52'41.9"W, 2325 m, 23 Apr 2002, *X. Munn-Estrada & Mendoza 2263* (NY); 50 km S de Valle Nacional, sobre la carretera a Oaxaca, 2250 m, 28 Jun 1975, *Rzedowski 33382* (NY); Distr. Mixe, 5.2 km NE de la desviación a Zacatepec, 2380 m, 23 Apr 1983, *Torres & Cedillo 2680* (NY); Distr. Mixe, 7 km NE de la desviación a Zacatepec, 2380 m, 23 Apr 1983, *Torres & Cedillo 2697* (NY); Distr. Villa Alta, 11.7 km N de Maravillas a 39.7 km al N de Zoogocho, 2020 m, 15 May 1983, *Torres et al. 2938* (NY); Distr. Mixe, 20 km N de Yacochi, camino a San Andrés Yaa, 2290 m, 8 Aug 1985, *Torres et al. 7108* (NY). **Veracruz,** Mpio.

Atzalan, La Calavera, Carretera Altotonga-Tlapacoyán, Cházarp & Dorantes 94 (ENCB). **U.S.A. Massachusetts:** "Hort. Cantab." [Botanical Garden at Cambridge, Harvard University], 1849, *A. Gray s.n.* (NY). **Missouri:** St. Louis Co., St. Louis, cult. by W. G. D'Arcy for the Second International Solanaceae Conference ("780425-2"), 6 Aug. 1982, *M. Nee 25507* (NY); **Switzerland.** HBBasil [Botanical Garden at Basil], 29 Jun 1863, *s.c. s.n.* (NY).; **Australia. South Australia:** Southern Lofty Region, Tusmore (suburb of Adelaide), pot grown, provenance unknown, 1 May 1991, *D. E. Symon s.n.* (NY).

## DISCUSSION

*Saracha* was once broadly construed to include a group of herbs widely distributed throughout Mexico, Central and South America that are now generally referred to *Jaltomata* (Gentry, 1973). *Saracha* is now recognized as a small genus of two species occurring at high elevations in South America with broadly or narrowly campanulate corollas and non or minimally accrescent calyces; it is part of a complex of several woody, mostly Andean genera, including *Iochroma*, *Dunalia* and *Acnistus* (Smith & Baum, 2006).

D'Arcy and Davis (D'Arcy, 1976), following Gentry's restoration of the genus *Jaltomata* and recognizing the species as separate from *Saracha*, transferred the species to the former as *Jaltomata viscosa*. He acknowledged, however, that its placement within *Jaltomata* was problematic. D'Arcy provided an excellent account of its history, with an expanded description of the taxon. Between the original description of *Saracha viscosa* and its transfer to *Jaltomata*, the species, besides to *Physalis*, had been assigned to *Witheringia* and *Athenaea* which, as constituted today, differ in a number of floral features and are clearly separate.

Subsequent to the work of D'Arcy and Davis, Mione (pers. comm.) grew and became familiar with the species in question. Mione noted that the taxon has red fruit, which are absent in all Mexican *Jaltomata*; because of this, and characters of the fruiting calyx, he rejected placement of the species in *Jaltomata*. Molecular studies (Mione et al., 1994) provide strong additional support for exclusion of

*S. viscosus* from that genus. *Jaltomata* possesses umbellate inflorescences which are not present in *Schraderanthus*, and the accrescent calyx is spreading in fruit.

Hunziker (1991) transferred *Jaltomata viscosa* to *Leucophysalis* and subsequently (1995) to *Chamaesaracha*. In his *Genera Solanacearum* (2001), Hunziker returns the species to *Leucophysalis*, where he notes that the systematic position of the species has been in dispute and assigned to six different genera, mostly without explanation, which, it seems, would include his own transfers. Hunziker also notes the peculiar disjunctions within *Leucophysalis*. *Leucophysalis grandiflora*, the generiotype, has the northernmost distribution of any North American Solanaceae, while *L. viscosa* is neotropical.

The characters that distinguish *Schraderanthus* from *Jaltomata* also distinguish it from *Leucophysalis* and *Chamaesaracha*. Excepting two doubtful species of sect. *Capsicophysalis* of the latter, red fruit are absent in *Chamaesaracha* and *Leucophysalis*. The flowers, with the broken green maculations at the base of the petals and distinctly lobed margins, also differ. Further, the wide disjunction between *L. grandiflora* and *Schraderanthus* and suggests a different origin.

Whitson and Manos (2005) conducted a two-gene analysis from selected physaloid species that showed a close relationship between *Leucophysalis grandiflora* and *L. nana*, and a distant relationship between both species and *Schraderanthus viscosus*. A phylogenetic analysis of morphological characters by Axelius (1996) provided some evidence for a closer relationship between *L. grandiflora* and *S. viscosus*, but additional analyses of fruit and calyx characters of the fruit would be useful. Unfortunately, there are few phylogenetic analyses that include *S. viscosus* and the two species of *Leucophysalis*. In short, *Chamaesaracha*, including the type, *C. coronopus*, is clearly a distinct assemblage.

Gentry (1974) treated *S. viscosus* as *Athenaea viscosa* and noted that it to be morphologically similar to a group of *Physalis* species that have a 5-lobed corolla and mostly several flowers from

individual axils, but lacking the inflated fruiting calyx. A similar observation was made by Nee (1986) and Mione et al. (1994).

*Schraderanthus* may be most closely related to *Brachistus*, *Darcyanthus*, and one or two species Hunziker (2001) have been treated as *Chamaesaracha* sect. *Capsicophysalis*; all have red or orange-red fruit and share other characters (Table 1). However, lacking any clear evidence that any are congeneric, it seems most appropriate to recognize *Schraderanthus* as a distinct genus. Table 1 summarizes the salient characters of *Schraderanthus* and closely related genera.

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Table 1. Comparison of characters of *Schraderanthus* and related genera.

	<i>Schraderanthus</i>	<i>Leucophysalis</i>	<i>Chamaesaracha</i> sect. <i>Chamaesaracha</i>	<i>Brachistus</i>
Habit	Erect, woody or herbaceous, annual/perennial	Erect, annual or spreading perennial herb	Ascending or spreading perennial herb	Erect shrubs or small trees
Inflorescence	Fasciculate, from axils	1 or 2 flowers from axils	1 or 2 flowers from axils	Fasciculate, from axils
Corolla	Rotate and reflexed, 5-lobed to parted	Rotate, little lobed, margins nearly entire	Rotate, slightly 5-lobed, not parted	Campanulate, 5-parted
Fruit	Red, fleshy berry	Green, fleshy berry	Green, dry berry	Red, fleshy berry
Fruiting calyx	Accrescent, reflexing under the berry at maturity, red	Accrescent, closely appressing and partially enclosing the berry, green	Accrescent, closely appressing and partially enclosing the berry, green	Accrescent, appressed to and enclosing the berry, green



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